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XTOD to Conventional Facilities Interface Control Document

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XTOD to Conventional Facilities Interface Control Document

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Sept. 28, 2005

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Change History Log

Rev Number	Revision Date	Sections Affected	Description of Change
000	9-28-05	All	Initial Version



Stanford Linear Accelerator Center
Stanford Synchrotron Radiation Laboratory

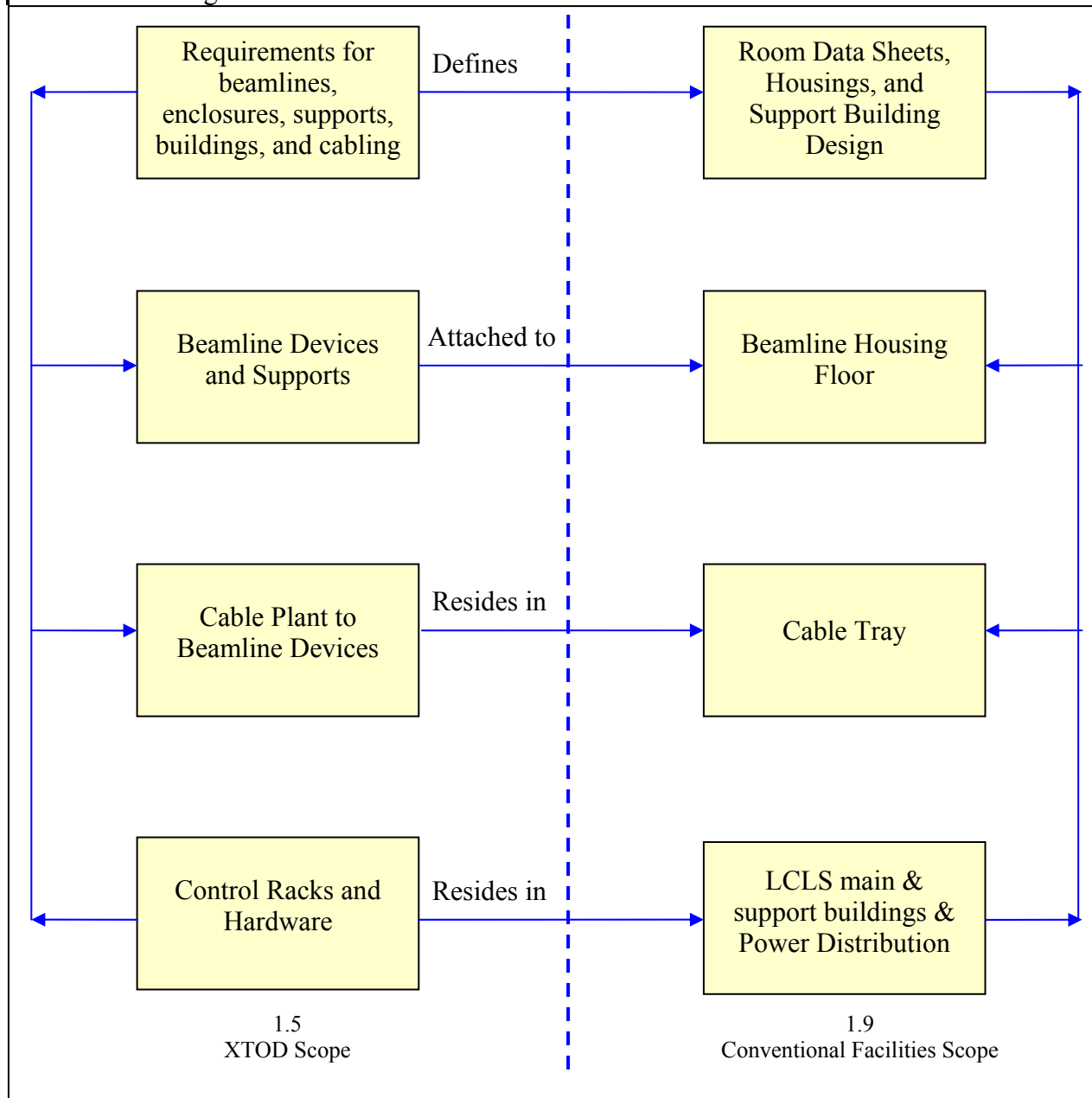
EXECUTIVE SUMMARY

1.1 Scope This document describes the interface between the LCLS X-ray Transport and Diagnostics (XTOD) (WBS# 1.5) and the LCLS Conventional Facilities (CF) WBS #1.1). The interface locations ranging from the beam dump to the far experimental hall are identified. Conventional Facilities provides x-ray, beamline and equipment enclosures, mounting surfaces, conventional utilities, compressed (clean, dry) air, process and purge gases, exhaust systems, power, and environmental conditions for the XTOD components and controls.

1.2 Responsibilities

WBS	Represented by	Responsible for:
1.5	<i>R. Bionta</i>	Supporting and approving this ICD
1.9	<i>D. Saenz</i>	Supporting and approving this ICD
1.5	<i>D. McMahon</i>	Preparing, maintaining, and approving this ICD

1.3 Interface Diagram



1.4 Interface Description			
Head- ing	Check	Type	Location and Description
3.1	X	Mechanical	Mounting surface/footing for component support
3.2	X	Fluid	Compressed air, purge and process gases
3.3		Vacuum	
3.4	X	Thermal	Enclosure isolated from outside environment
3.5		RF	
3.6	X	Electrical	Power distribution to racks, ground connections, convenience outlets and lighting,
3.7	X	Power	Power for racks, convenience outlets and lighting
3.8	X	Signal	Interlocks to PPS
3.9	X	Radiation	Electrons, X-Rays
3.10	X	Environmental	Ventilation, HVAC
3.11		Other	

2.0 Applicable Documents

- 1.1-101 LCLS Cable Specifications
- 1.5-001 XTOD Physics Requirements
- 1.9-001 Physics Requirements for Conventional Facilities
- 1.9-100 Shielding Requirements for the LCLS Project (Title I)
- 1.9-101 Architectural/Engineering Design Guidelines
- 1.9-102 Generic Accelerator Tunnel Construction Tolerance Specification
- 1.9-104 Emergency Lighting Specification
- FEE, NEH, Tunnel, and NEH Room Data Sheets

3.0 Interface Definition

The interface between the LCLS XTOD and Conventional Facilities Systems occurs all along the physical expanse of the Front End Enclosure, Near Experimental Hall, Tunnel, Far Experimental Hall, and surface Equipment Shelters. CF provides the beamline housing structures in which the XTOD components are mounted. CF also provides all cable trays, water headers, air headers, process and purge gas headers, exhaust system headers, convenience outlets, lighting, power distribution for electrical equipment racks and XTOD components, and HVAC as required for equipment in the FEE, Tunnel, and NEH. CF also upgrades utilities as required in existing housings and support buildings as required for the XTOD beamline and controls.

The XTOD System installs components and systems within the structures provided by Conventional Facilities. The interface varies with type of component. XTOD installs the cable plant into cable trays installed by CF. CF installs anchors, per XTOD specifications, in order to mount beamline components and equipment. XTOD installs racks in equipment shelters and FEE, Tunnel, NEH, and FEH locations provided by CF. CF provides network, power distribution and ground connections to the process racks. XTOD will specify the power requirement. CF provides compressed air, process and purge gas, and exhaust system headers

with valves at locations specified by XTOD. XTOD provides specifications to CF on, internal enclosure dimensions, cable tray dimensions and routing and gas, power, temperature and humidity requirements. Shielding requirements will be provided by the SLAC Radiation Physics department based on electron beam requirements. XTOD also requires review of the implementation of LOTO and Fire Protection/Life Safety design in the power distribution.

3.1 Mechanical Requirements – Mechanical interfaces are at the housing floor for beamline devices, housing floor for process equipment rack mounting, housing walls for beam transport pipes, power connection at each process equipment rack for power distribution, cable tray for cable plant installation, nipples at valves for water distribution and nipples at valves for air, process, and purge gas distribution, and trunk headers for exhaust systems.

3.2 Fluid Requirements – Compressed air, process and purge gas, and exhaust headers provided by CF with valve locations specified by XTOD. XTOD provides HVAC requirements.

3.3 Vacuum Requirements – None

3.4 Thermal Requirements – The enclosure provided by CF will form a thermally controlled volume for the FEE and the NEH hutches.

3.5 RF Requirements – None

3.6 Electrical Requirements – Cabling providing power to distribution panels and beamline in the FEE, NEH, Tunnel, and FEH will be installed by CF. CF to provide certified electrical ground connections throughout the FEE, NEH, Tunnel, and FEH. Cabling from process racks to beamline equipment will be installed by XTOD (or Controls Department). All cable trays are to be installed by CF. XTOD will provide cable tray dimensions and routing diagrams for tray to XTOD components and systems. Cabling requirements to conform to the LCLS specification, “1-101 LCLS Cable Specifications”.

3.7 Power Requirements – CF to provide power to distribution panels. CF will also provide convenience outlets and welding power outlets. XTOD will provide power requirements.

3.8 Signal Requirements – XTOD will provide signals from requisite XTOD systems to the PPS to turn off housing lights and power to hazards. CF will provide networking for XTOD controls.

3.9 Radiation Requirements – CF to provide housing wall thickness and geometry to meet radiation shielding. Shielding requirements will be provided by the SLAC Radiation Physics department based on electron beam requirements. Radiation shielding to conform to the LCLS specification, “1.9-100 Shielding requirements for the LCLS Project”.

3.10 Environmental Requirements – CF to provide ventilation in FEE, Tunnel, and NEH. CF to provide air conditioning in FEE and NEH.

3.11 Other Requirements – None.

4.0 Verification – Verification of all requirements to be performed during system commissioning. Performance goals for each system to be tested are described in the Physics Requirements Documents.

5.0 Notes – Construction of global controls feedback and controls infrastructure to be managed and funded from WBS 1.1 LCLS Management and Integration.